

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference D3-A0304P	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, Item 5 below.	
International application No. PCT/JP2004/009370	International filing date (day/month/year) 25/06/2004	(Earliest) Priority Date (day/month/year) 27/06/2003
Applicant  DNAVEC RESEARCH INC.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 06 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☒ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☒ **Certain claims were found unsearchable** (See Box II).

3. ☐ **Unity of invention is lacking** (see Box III).

**4. With regard to the title,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

**5. With regard to the abstract,**

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

**6. With regards to the drawings,**

- a. the figure of the **drawings** to be published with the abstract is Figure No. \_\_\_\_\_

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☒ none of the figures is to be published with the abstract.

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Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the International application and necessary to the claimed invention, the international search was carried out on the basis of:

a. type of material

☒

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☒

in written format

☒

in computer readable form

c. time of filing/furnishing

☐

contained in the international application as filed

☐

filed together with the International application in computer readable form

☒

furnished subsequently to this Authority for the purpose of search

2. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/505 A61K48/00 C12N5/06 C12N15/62

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KUME AKIHIRO ET AL: "In vivo expansion of transduced murine hematopoietic cells with a selective amplifier gene." THE JOURNAL OF GENE MEDICINE. MAR 2003, vol. 5, no. 3, March 2003 (2003-03), pages 175-181, XP009039186 ISSN: 1099-498X the whole document	1,3,4,8, 10-13
X	HANAZONO Y ET AL: "In vivo selective expansion of gene-modified hematopoietic cells in a nonhuman primate model" GENE THERAPY, vol. 9, no. 16, August 2002 (2002-08), pages 1055-1064, XP002303770 ISSN: 0969-7128 abstract	1-4,8-13
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*8\* document member of the same patent family

Date of the actual completion of the international search

3 November 2004

Date of mailing of the international search report

17/12/2004

Name and mailing address of the ISA

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Authorized officer

Pilat, D

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>NAGASHIMA TAKEYUKI ET AL: "New selective amplifier genes containing c-Mpl for hematopoietic cell expansion."            BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS,            vol. 303, no. 1,            28 March 2003 (2003-03-28), pages 170-176,            XP002303771            ISSN: 0006-291X            abstract</p>	1,3-6, 8-13
X	<p>JIN LIQING ET AL: "In vivo selection using a cell-growth switch"            NATURE GENETICS,            vol. 26, no. 1, September 2000 (2000-09),            pages 64-66, XP002303772            ISSN: 1061-4036            the whole document</p>	1,3-6, 8-13
X	<p>KROSL JANA ET AL: "Interleukin-3 (IL-3) inhibits erythropoietin-induced differentiation in Ba/F3 cells via the IL-3 receptor alpha subunit"            JOURNAL OF BIOLOGICAL CHEMISTRY,            vol. 271, no. 44, 1996, pages 27432-27437,            XP002303773            ISSN: 0021-9258            abstract</p>	14,15
X	<p>SHIKAMA YAYOI ET AL: "A constitutively activated chimeric cytokine receptor confers factor-independent growth in hematopoietic cell lines"            BLOOD,            vol. 88, no. 2, 1996, pages 455-464,            XP002303774            ISSN: 0006-4971            abstract</p>	14,15
P,X	<p>UEDA KYOJI ET AL: "A novel hematopoietic stem cell gene therapy method without marrow conditioning by intra-bone marrow transplantation combined with selective amplifier gene."            BLOOD,            vol. 102, no. 11,            16 November 2003 (2003-11-16), pages            200a-201a, XP009039244            &amp; 45TH ANNUAL MEETING OF THE AMERICAN SOCIETY OF HEMATOLOGY; SAN DIEGO, CA, USA;            DECEMBER 06-09, 2003            ISSN: 0006-4971            abstract</p>	1-15
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>NAGASHIMA TAKEYUKI ET AL: "In vivo expansion of gene-modified hematopoietic cells by a novel selective amplifier gene utilizing the erythropoietin receptor as a molecular switch." THE JOURNAL OF GENE MEDICINE. JAN 2004, vol. 6, no. 1, January 2004 (2004-01), pages 22-31, XP009039187 ISSN: 1099-498X the whole document</p> <p>-----</p>	1-15
T	<p>UEDA K ET AL: "High-Level in Vivo Gene Marking after Gene-Modified Autologous Hematopoietic Stem Cell Transplantation without Marrow Conditioning in Nonhuman Primates" MOLECULAR THERAPY, ACADEMIC PRESS, SAN DIEGO, CA,, US, vol. 10, no. 3, September 2004 (2004-09), pages 469-477, XP004552231 ISSN: 1525-0016 the whole document</p> <p>-----</p>	1-15
T	<p>HARA T ET AL: "Expansion of genetically corrected neutrophils in chronic granulomatous disease mice by cotransferring a therapeutic gene and a selective amplifier gene." GENE THERAPY. SEP 2004, vol. 11, no. 18, September 2004 (2004-09), pages 1370-1377, XP002303775 ISSN: 0969-7128 abstract</p> <p>-----</p>	1-6,8-13

# INTERNATIONAL SEARCH REPORT

International application No.  
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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 1-11  
because they relate to subject matter not required to be searched by this Authority, namely:  
Although claims 1-11 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.